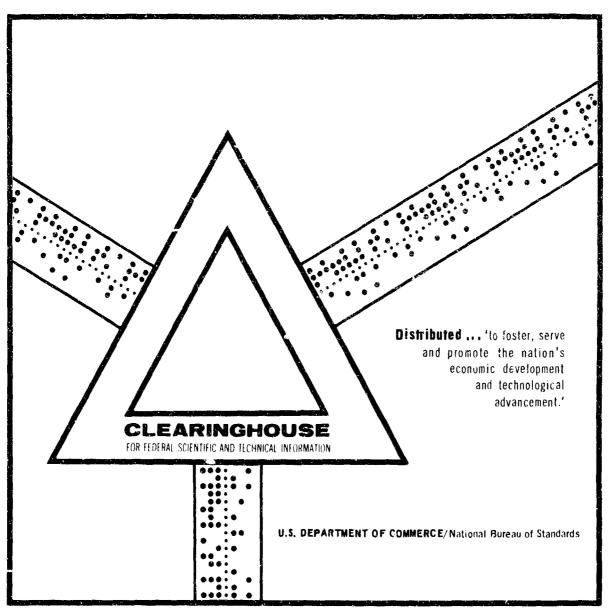
INFORMATION RETRIEVAL SYSTEM, VOLUME I

Jack D. Mahle, Jr., et al

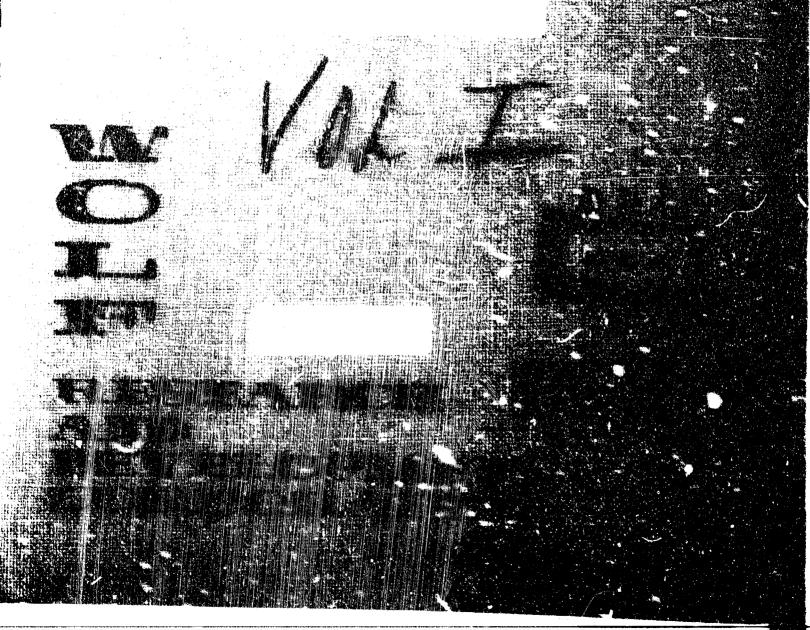
Wolf Research and Development Corporation Riverdale, Maryland

28 November 1969



This document has been approved for public release and sale.

INFORMATION RETRIEVAL SYSTEM



INFORMATION
RETRIEVAL
SYSTEM

Prepared for

Data Systems Division
Fort Detrick
Frederick, Maryland

Prepared by
Wolf Research and Development Corporation
6801 Kenilworth Avenue
Riverdale, Maryland

28 November 1969

SYSTEM ID:

IRS

TITLE:

INFORMATION RETRIEVAL SYSTEM

PURPOSE OF THE SYSTEM:

The purpose of the Information Retrieval System is to store information about the scientific and technical reports and documents of the Fort Detrick Technical Library and to retrieve this information using "searches" and special print programs.

REQUESTED BY:

ANALYST:

Jack D. Mahle, Jr.

PROGRAMMERS:

Jack D. Mahle, Jr. and

Sally Lukasiewicz

DOCUMENTED BY:

Jack D. Mahle, Jr.

DATE LAST REVISED:

SOURCE LANGUAGE:

COBC

COMPUTER:

CDC 3150

REQUIRED COMPONENTS:

Paper Tape Reader

Two Magnetic Tape Transports

Four Disk Pack Drives

Card Reader Line Printer

OBJECT TIME STORAGE REQUIREMENTS-

Main Memory: Secondary:

SECURITY CLASSIFICATION-

Program:

Data:

REVIEWED BY:

APPROVED BY:

Chief,

Systems Branch

Chief,

Data Systems Division

### SYSTEM DESCRIPTION:

The Fort Detrick Information Retrieval S, stem is a system of computer programs written in COROL to store and retrieve information about the scientific and technical reports and documents of the Fort Detrick Technical Library. The documents and reports have been abstracted and their subject matter indexed using descriptors.

This abstract, the subject matter descriptors, the document's title, the personal authors, the corporate authors, the document's series and contract numbers, any security classifications, and other pertinent information about each of the documents or reports make up the master record of the Information Retrieval System. The size of this record is up to 2300 characters, 980 of which are allotted to the abstract and 240 for up to 48 5-digit numeric descriptors.

A thesaurus file of the 5-digit numeric descriptors and their equivalent English meanings is maintained for the system. It is needed so that the numeric code can be translated into English in the printing out of the system's information.

As a means of accessing the information of the master file an additional file is used. It is called a search or inverted file and is used in a subject matter search of the master file. While the records of the master file are arranged by accession number of the individual document and the subject matter of that document is indicated by one or more descriptor codes, the inverted file records are arranged by descriptor

code with the accession number of each master record indexed by that descriptor code. Thus each record of the inverted file contains one descriptor code and all of the accession numbers of each master record that contains that descriptor. These records are arranged numerically ascending by descriptor code.

This arrangement allows for quickly retrieving the accession numbers of the documents that contain information on a particular subject. For example: you want to know which documents contain information on microbiology...you know that the numeric descriptor equivalent to that English language descriptor is 01745....you go to record 1745 of the inverted file and you find the accession numbers 37734, 47630 and 21138. With the accession numbers of the documents that contain information on microbiology you then can access the master file using these accession numbers. As further example: You may wish to search the master file for the documents that contain information on both microbiology and viruses. To do this you would go the records in the inverted file for microbiology and viruses; e.g., records 01745 and 02733. You find document accession numbers 37734, 47630 and 21138 at the microbiology record and you find document accession numbers 27371, 37734, and 47630 at the viruses record. By comparing the accession numbers you know that documents 377 and 47030 contain information on both microbiology and viruses.

With this ability to retrieve the accession number of documents on a particular subject you can also arrange your search criteria to exclude documents that contain certain subjects.

In addition to these logical "AND" and "NOT" searches you may also logically "OR" and "NOR" combine descriptors together in one search of the master file.

Other searches of the master file can be made by individual personal author, individual corporate author, individual series number, and individual contract number. These types of searches cannot be logically combined. You can only search for a single personal author, a single corporate author, a single series number, or a single contract number during one search of the file.

PROGRAM ID:

IRO.

TITLE:

PTRDRTN - Paper Tape Read Program

PURPOSE OF PROGRAM:

The purpose of this program is to read the 8-channel flexowriter paper tape containing all the input unit records for the system, convert those records into a CDC 3150 compatible code, and write them out on a magnetic tape and the printer.

ANALYST:

Jack D. Mahle, Jr.

PROGRAMMER:

Jack D. Mahle, Jr.

DOCUMENTED BY:

Jack D. Mahle, Jr.

**SOURCE LANGUAGE:** 

COMPASS

COMPUTER:

CDC 3150

REQUIRED COMPONENTS:

Paper Tape Reader

Line Printer

Magnetic Tape Transport

OBJECTIVE TIME STORAGE REQUIREMENTS-

Main Memory: Secondary:

#### PROGRAM DESCRIPTION:

The flexowriter paper tape that is the input to this program is punched in an eight bit, upper and lower case character code. These characters are, of course, not the same as the CDC characters and must be translated to the CDC code character by character. As each character is checked it has to be remembered as to whether you are in upper case mode or lower case mode to determine the proper translation to give to the character.

After each character is checked and properly translated it is stored in an output area. When 135 characters are stored they are written out on a magnetic tape and onto the line printer. PROGRAM ID:

IRO2

TITLE:

ONTODISK

PURPOSE OF PROGRAM:

The purpose of this program is to edit the magnetic tape created in IRO1. If the data is correct, properly formatted input records are written out onto disks to be input to IRO3.

ANALYST:

Jack D. Mahle, Jr.

PROGRAMMER:

Jack D. Mahle, Jr.

DOCUMENTED BY:

Jack D. Mahle, Jr.

SOURCE LANGUAGE:

COBOL

COMPUTER:

CDC 3150

REQUIRED COMPONENTS:

2 Magnetic Tape Transports

4 Disk Pack Drives

Line Printer

OBJECT TIME STORAGE REQUIREMENTS-

Main Memory:
Secondary:

#### PROGRAM DESCRIPTION:

ONTODISK is an editing and formatting program. The input to program is the magnetic tape created in IROI from the paper tape unit records. Each item of the unit record is preceded by a // and an item number from 01 to 92. //01 indicates a new unit record. //92 indicates an action code follows. If there is no //92 in the unit record, the action code is assumed to be ADD.

Each of the items are limited to a certain number of characters, so item length is one of the program checks. Certain items must be numeric so that is another check for some items. Missing items are blank filled.

When a //01 is encountered the previously edited items are written out onto three different disk files. The "Abstract" of the unit record is written out onto one file; the "Abbreviated Citation" portion is written out onto a third.

These three files will be input to IRO3. The format of the records of these three files is identical with the three records formats of the three files which make up the master file.

Action codes of ADD, REP (replace), and DEL (delete) are the standard action codes for the input records. Two additional action codes are allowed in ONTODISK. They are

CHG (change) and CHA (change accession number). CHG is used to indicate a partial input record where only certain items of an existing record are to be changed. CHA is used to indicate a change in accession number only.

When CHG is used the partial input record must be as follows: //01 (classification) //92CHG//02 (existing accession number of the unit record to be changed) followed by //, the item numbers of the items to be changed and the new information of that item. All items of a unit record may be changed this way.

When CHA is used the partial input record must be as follows: //01 (classification) //92CHA//02 (existing accession number) //02 (the new accession number).

The ABBREVIATED CITATION file, the DESCRIPTOR-REST OF RECORD file, and ABSTRACT file must be readied for input to this program because if CHA or CHG type records are input then the program retrieves these records from the disks and tape, puts in the new information and then writes these records out as REP type input records in the case of CHG or as ADD (with new accession number) and DEL (with old accession number) in the case of CHA.

PROGRAM ID:

IR03

TITLE:

FILE MAINTENANCE PROGRAM (IRS-FMP)

PURFOSE OF PROGRAM:

The purpose of this program is to provide the means each month of updating the master file of the system with new accessions. The master file, because of its size, is divided into three sections; the ABBREVIATED CITATION file, the DESCRIPTOR-REST OF RECORD file and the ABSTRACT file. In addition to the update of the master file, an inverted file of accession numbers by descriptor is maintained. A listing of the new accessions is produced.

REQUESTED BY:

ANALYST:

Jack D. Mahle, Jr.

PROGRAMMER:

Jack D. Mahle, Jr.

DOCUMENTED BY:

Jack D. Mahle, Jr.

SOURCE LANGUAGE:

COBOL

COMPUTER:

CDC 3150

REQUIRED COMPONENTS:

2 Magnetic Tape Transports

4 Disk Pack Drives

Card Reader Line Printer

OBJECT TIME STORAGE REQUIREMENTS-

Main Memory:
Secondary:

#### PROGRAM DESCRIPTION:

This program is the update program for all f the major files of the system, excepting the THESAURUS file which because of core limitations has its own update program. The files that are updated in this program are the master file, an inverted file, and a dictionary file. The master file, because of the number of records and the length of each record, must be divided into three separate files. The division of the master file is as follows: (1) the information necessary for the abbreviated citation listing of a search run and special listing runs of personal author, corporate author, contract number and series number, (2) the abstract and its classification, and (3) the numeric descriptors and the rest of the unit record. The first and the third portions are disk files, the second is a tape file.

The linking item of each of these records is an assigned accession number.

The inverted file is used for the searches and is an arrangement of all the descriptor codes in the system followed by the accession numbers of the documents in which the descriptors appear.

The dictionary file is the index created by program to provide the means of accessing the two disk portions of the master file.

Because these files are the heart of the system (excepting again the THESAURUS) a discussion of them is necessary to the understanding of the program.

THE FILES-

COBOL Name

Descriptive Name

ABBREV-CITE-FILE Abbreviated Citation File

# Description

This file is an index sequential disk file and is one of the three files that make up the complete master file. Although it is called the Abbreviated Citation File, it contains more items than just the ones needed for the Abbreviated Citation printout of the search. These other items are all of those needed for all the printouts except the complete unit record and the Accession Number within the Descriptor Listing. An additional item of each record of this file, not a part of the complete unit record, is a 2 character counter in which is stored the number of personal authors in the record.

This file is used in the Master File Update run, the Special Listings Run except when the Accession Number within Descriptor Listing (DESCRL-IR10) is being printed, and the Retrieval Run except when accession numbers only are outputted.

COBOL Names

Descriptive Name

OLD-ABSTRAK-FILE

NEW-ABSTRAK-FILE

TEMP-ABSTRAC-FILE

Temporary Abstract File

# Description

These three files are identical in record format. Each record contains one abstract from a Complete Unit Record, the classification of that abstract and the accession number of the Unit Record. The New Abstract and Old Abstract files are single reel sequential access tape files. The Old Abstract File is the input file to the Master Update Run, the New Abstract File is the output. This New Abstract File becomes the Old Abstract File on the next Master Update Rur. The New Abstract File, when created, is another of the three files that make up the complete Master File. (The labels of these two files are the same, THEABSTRACT.) The Temporary Abstract File is a disk file on which the incoming update abstracts, abstract classifications, and unit record accession numbers are temporarily stored prior to their being added to the Old Abstract File to create the New Abstract File. The Temporary Abstract File is also used to supply the abstract and abstract classification in the printout of the monthly accession listing. The most current abstract tape is used as input to the Special Listing Run of IRSERCH2 to produce a dump of the master file in the form of a complete unit record listing and is used in the Retrieval Run of IRSERCH2 when the complete unit record listing is requested.

COBOL Name Descriptive Name

DESC-R-OF-R-FILE Descriptors and Rest of Record

File

# Description

This file is index sequential disk file and is one of the three files that make up the complete master file. It contains the numeric descriptor codes and the accession number of each unit record plus all the rest of the items of the unit record not contained in the abstract and Abbreviated Citation files. In addition, each record of the file contains a two character item, not a part of the complete unit record, used as a counter for the number of descriptors in each record. This file is used in the Master Update Run, in the Special Listing Run (when Complete Unit Record Listing is required), and in the Retrieval Run (when Completed Unit Record Listing is requested).

COBO'. Name Descriptive Name

THE-SEARCH--FILE The Inverted File of Accession
Numbers within Descriptors

## Description

THE-SEARCH--FILE is a directly accessed disk file. Each record of this file contains a numeric descriptor code and the accession numbers if the master records in which that numeric descriptor code appears. If a descriptor has more accession numbers than space is allotted for (29 per record) then an additional record is allotted for that descriptor with space for 29 more accession

numbers. The address of this continuation record is contained in the last twelve characters of the first record and as many other continuation records as is necessary to contain all the accession numbers for a particular descriptor. These continuation records are chained in the same way to the preceeding portion of the record and so on back to the first. The numeric values of these numeric descriptor codes range from 0 to 12,999. Because of this the first one of each of 12,999 locations of the file are assigned, in ascending order of numeric descriptor code, to each descriptor and a maximum of 29 of their associated accession numbers. (Most of the descriptors have less than 29 associated accession numbers - the average is 10.) If the descriptor has more than 29 associated accession numbers than the required continuation records are assigned on a first come, first serve basis, starting at location 13,001. Location 13,000 contains the address of the next available location in the file. Since the first portion of the record (maybe the whole record) belonging to numeric descriptor code 00001 is in file location 1 of the file and that the first portion of the record belonging to numeric descriptor code 00002 is in file location 2 and so on to numeric descriptor 12,999, the numeric descriptor code itself can easily be used in an algorithm to find the disk address of the first portion of any record and in the last twelve characters of that record the address of any continuation of the record.

This search file is used in the file maintenance run of the master file, in the retrieval run, and in the listing of accession numbers by descriptors. COBOL Name

Descriptive Name

DICTIONARY -- FILE

Dictionary of Master File Records Disk Addresses

# Description

DICTIONARY--FILE is a randomly accessed disk file. It has three different type records. Type one has one record. It is in location 1 of the file. Type two has 104 records in locations 2 through 105. Type three has a variable amount beginning in location 106. The type one record contains information about the two other types of records and is explained below. The 105 type two records contain the disk addresses of locations on the ABBREV-CITE-FILE and DESC-R-QF-R-FILE that have been made available for use in the previous update by deletions and/or replacements to those two files. The rest of the file's records, type three, contain the accession numbers and disk addresses of the valid records in the ABBREV-CITE-FILE and DESC-R-OF-R-FILE. Additionally, each of these type three records contain a three character item called ACTION-CODE used to indicate that the record came from the file during the dictionary update subprogram of the Master Update Run IRO3.

The type one record contains three items. The first item is the number of records of the third type, i.e., accession numbers and disk address of the valid records in ABBREV-CITE-FILE and DESC-R-OF-R-FILE.

The second item of the type one record is the address of the next available disk location (at the end of the file) in the ABBREV-CITE-FILE and DESC-R-OF-R-FILE. The third item of the type one record is the number of records of the second type record (i.e., disk address of record locations on the ABBREV-CITE-FILE and DESC-R-OF-R-FILE)

that have been made available for use in the previous update by deletions and/or replacements to those two files.

DICTIONARY--FILE is used in the master update run, the special listing run (except the accession number within descriptor listing) and the retrieval run. The locations of the type one and type two records of this file are known and can be accessed directly. The type three records are accessed using the same halving method as described for THESAURUS---FILE.

The procedure used to update these files is to randomly append each new accession to the abbreviated citation file and the descriptor-rest of record file; then to put the abstract on the temporary abstract file. . . . The next update is of the search file. New descriptors and the new replacing descriptors are added to the search file. Deleted descriptors and the old replaced descriptors are removed from the search file in a later procedure. Following the additions to the search file the update of the dictionary of the addresses of the abbreviated citation file and the descriptor-rest of record file takes place. The update of the dictionary is a process that is logically identical to the update of the THESAURUS file. After the dictionary upd. In the deletion on the search file is performed.

The printing of the accession is the next procedure. To print the complete unit record requires an access of THESAURUS file as is described under IRO3. If any of the accessions are classified or if they are to be suppressed then the title accession number and title classification is written out on another file for printing after the monthly accession listing. When this printing of the other listing (classified and suppressed accessions) is completed the IRS file maintenance is through.

PROGRAM ID:

IRO4

TITLE:

THESAURUS UPDATE (IRS-THES)

PURPOSE OF PROGRAM:

The purpose of the program is to give the capability to update the THESAURUS file with additions, replacements, and deletions.

ANALYST:

Jan' D. Mahle, Jr.

PROGRAMMER:

Jack D. Mahle, Jr.

DOCUMENTED BY:

Jack D. Mahle, Jr.

SOURCE LANGUAGE: COBOL

COMPUTER:

CDC 3150

REQUIRED COMPONENTS: 1 Magnetic Tape Transport

1 Disk Pack Drive

Line Printer Card Reader

OBJECT TIME STORAGE REQUIREMENTS

Main Memory:
Secondary:

#### PPOGRAM DESCRIPTION:

The THESAURUS file is a randomly accessed disk file. Each of its records contain a subject matter descriptor (English language) and the associated numeric code. Since the subject matter descriptor codes are maintained on the master file (the DESC-R-OF-R-FILE portion of the master file) in their numeric code form, it is through the use of this THESAURUS file that the English language equivalents are obtained for the various printouts as required.

The file, although randomly accessed, is maintained in ascending order of numeric descriptor codes.

The means of accessing the particular record needed is through a halving process. The numeric code to be translated is compared to the numeric codes of the nine records of the block of records at the middle of the file. Then, depending on whether it is greater or less than these numeric codes, it is compared to the numeric codes of the records of the block of records at the middle of the top half or bottom half of the file. This method of halving continues until the matching numeric code is found and the English language equivalent then is moved to the printout area. This method of accessing the THESAURUS file is not used in this program. However, since it is the method or accessing this file the technique is discussed here.

The method used to update the THESAURUS file is an "inplace" updating technique. The file is opened as an input/output file and selected as randomly accessed. Because of this, since the file is sequentially ascending arranged because of an input area equal in size to the maximum number of input cards, the file can remain essentially inplace. When an input record that fits between two existing file records is encountered the higher one of those records from the file can be moved into the input area, the input area internally resorted, and processing continues from that point.

After the update of the THESAURUS is completed two types of listings can be produced depending upon the options declared on the THESAURUS LISTING OPTION CARD. (See Appendix C, page C-2). One listing is of all the additions, replacements, and deletions to and from the file. The other listing is a dump of the whole THESAURUS file as it is following the update.

PROGRAM ID'S:

IR05, IR06, IR07

TITLES:

DISK FILE SAVE PROGRAMS

PURPOSE OF PROGRAMS:

The purpose of these three programs is to provide the means to dump the five disk files onto tape and to be able to put them back onto the disks. The necessity for this capability is to provide the necessary back-up files on tape.

ANALYST:

Jack D. Mahle, Jr.

PROGRAMMER:

Jack D. Mahle, Jr.

DOCUMENTED BY:

Jack D. Mahle, Jr.

SOURCE LANGUAGE:

COBOL

COMPUTER:

**DC** 3150

REQUIRED COMPONENTS:

2 Magnetic Tape Transports

4 Disk Pack Drives

OBJECT TIME STORAGE REQUIREMENTS -

Main Memory: Secondary:

## PROGRAM DESCRIPTION:

These three programs are designed to enable the saving and restoration of the five permanent disk files of the system. These files are written out onto tape in a format on disk. This enables the entire process to be essentially a disk to tape and tape to disk procedure. The five files that can be saved and restored are (1) the abbreviated citation file, (2) the descriptor-rest of record file, (3) the search file, (4) the dictionary file, and (5) the thesaurus file. The program to save and restore the first two files (1) and (2) is one program; the program to save and restore the second two files (3) and (4) is one program; the program to save and restore the fifth file (5) is one program.

PROGRAM ID:

IR08

TITLE:

IRSERCH

PURPOSE OF PROGRAM:

The purpose of this program is process the search criteria cards and to retrieve all of the accession numbers of the documents that contain the descriptors of the search criteria card. These descriptors are both the positive and negative descriptors (i.e., AND, OR, & BUT NOT & NOR descriptors). These accession numbers are written out on to two files, positive and negative.

ANALYST:

Jack D. Mahle, Jr.

PROGRAMMER:

Jack D. Mahle, Jr.

DOCUMENTED BY:

Jack D. Mahle, Jr.

SOURCE LANGUAGE:

COBOL

COMPUTER:

CDC 3150

REQUIRED COMPONENTS:

Card Reader

2 Disk Pack Drives

OBJECT TIME STORAGE REQUIREMENTS -

Main Memory:
Secondary:

## PROGRAM DESCRIPTION:

This program processes the four type cards of the search criteria (see Appendix C). According to the search criteria cards submitted, the positive 'AND & OR) and negative (BUT NOT & NOR) accession numbers are retrieved from the search file. These accession numbers, with the proper identifying information, are written out onto temporary disk files to be processed later by the next program, IRSERCH2, IRO9. But prior to input to this IRSERCH2 program the two files must be sorted by accession number.

PROGRAM ID:

IR09

TITLE:

IRSERCH 2

**PURPOSE** OF PROGRAM:

This program has three modes of operation: (1) as the file selector and print program for the Boolean type searches started in IRSERCH, (2) as the only program for the personal author, corporate author, contract number, and series number searches, (3) as the print program for the special listing of the whole file; i.e., "UNITRECORD BY ACCESSION NUMBER".

ANALYST:

Jack D. Mahle, Jr.

PROGRAMMER:

Jack D. Mahle, Jr.

DOCUMENTED BY:

Jack D. Mahle, Jr.

**SOURCE** LANGUAGE:

COBOL

COMPUTER:

CDC 3150

REQUIRED COMPONENTS:

Card Reader

2 Magnetic Tape Transports

4 Disk Pack Drives

Line Printer

**OBJECT** TIME STORAGE **REQUIREMENTS** -

Main Memory: Secondary:

## PROGRAM DESCRIPTION:

To perform the main purpose of this program; i.e., the final selection and printing out of accession numbers. the output from IRSERCH must have been sorted prior to input to this program. The same search criteria cards submitted in IRSERCH must be resubmitted with this program. There is an additional card that must be submitted to this program prior to the search criteria cards. This card is the "NAME" card. For the format of this card see Appendix C. To perform the second purpose of this program requires no previous run of IRSERCH. Two cards are required by this procedure. These control cards are the "SEARCH CARD", used to indicate the type of listing desired and the "SEARCH CARD 2" used to indicate the type of search and to give the search parameter. For the format of these cards see Appendix C. To perform the third purpose of this program also requires no previous run of IRSERCH but does require a control card (see Appendix C, page C-9). This control card causes the listing of the entire master file in complete unit record format by accession number.

PROGRAM ID'S:

IR10, IR11, IR12

TITLES:

SPECIAL LISTING PROGRAMS

PURPOSE OF PROGRAMS:

The purpose of these three programs is to list selected information of the master file sorted by personal author, corporate author, contract number, and series number and to list the accession numbers by descriptors.

ANALYST:

Jack D. Mahle, Jr.

PROGRAMMER:

Sally Lukasiewicz

DOCUMENTED BY:

Jack D. Mahle, Jr.

SOURCE LANGUAGE:

COBOL

COMPUTER:

CDC 3150

REQUIRED COMPONENTS:

4 Disk Pack Drive

Line Printer

Card Reader

OBJECT TIME STORAGE REQUIREMENTS -

Main Memory: Secondary:

## PROGRAM DESCRIPTION:

These three programs are the extraction program and print programs required to produce the special listings sequenced by personal author, corporate author, contract number, series number, and accession number by descriptor number. IR10 is the program to produce the accession number by descriptor number. IR11 extracts the information from the abbreviated citation file for the special listings of IR12 which is the print program for the rest of the special listings.

# APPENDIX A SYSTEM FLOWCHARTS

(The System Flowcharts are in a separately bound volume with Appendix B, the Detailed Flowcharts.)

APPENDIX B
DETAILED FLOWCHARTS

(The Detailed Flowcharts are in a separately bound volume.)

APPENDIX C

SUPPLESS CARD CARD

APPENDIX C

TO SUPPRESS THE LISTING OF ANY NEW UNIT RECORD FREM
COMING OUT ON MONTHLY HOCESSION LISTING PUT THE
ACCESSION NUMBER OF THIS UNIT RECORD ON THIS TYPE PERMITTED. UP TO 5 "LISTIMG SUPPLESS" CARD MAY CARD. UP TO 14 ACCESSION NUMBERS PER CARD ARE BE INCLUDED IN ANY ONE FILE MATHITHMER RUN. ACCESSION ACCESSION

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\* WITH 'AND", OR", BUT NOT", & "NOR" CAKDS

"AND" OE" BUT NOT" AND THE NOCH CHILL

CLZD FORMAT

APPENDIK C

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|  | "AND" & "BUT NOT" CARDS; IN DESCRIPTOR POSITIONS "BUTNOT"  |
|  | 1 THRU 5 FOR "OR" & "NOR CHRO, ONLY ONE MAD CITEDIO.  CARD ARE ALLEWED, UP TO FIVE "OR" & "NOR" CARDS MEE  |
|  | <b>`</b> ×   |
|  | MINIMUM NUMBER OF CARDS PER RUN IS ONE "AND" OF ONE "ONE "AND" OF ONE "OR" OARD. THE CARD(S) MUST BE INFUT TO FOTH INSEARCH & IRSERCHZ.  |

C=5

AMC 10th 1600-R

ME STHER STAPULLS SENRING CARDIDAMA

APPENDIX C

SEARCHAN TO REQUEST NUMBER

"AC" FOR ABBREVIATED CITATION LISTING IN \* SPECIFY "UR" FOR COMPLETE UNIT RECORD LISTING CARD COLUMNS 9 \$10.

THE OTHER SEARCHES NRE:

C- 6

CORPORATE AUTHOR STANCH,
OURSONAL AUTHOR STACCH,
CONTRIKT AUMBER STANCH, MD

A SECEND SEMPON CARD, "SEMPCHOL", IS REQUIRED (SEE C-6).

AMC 1000.

| MASSINGLES SEARCHES SEARCH CALL 2 CARD COMPANIENT AND SEARCHES SEA |                    |  |                 | 12) 45/6/2012 12/16 C 1 30/2012 20/201 | 100 (101) HE         | "OTHER SINKINGS SENNER CARD", THIS OARD INDICATES | THE TYPE OF SENDEH IN CARD PRUMUS 9 and 10. | TO PLETERMY A PERSONAL AUTHOR SENREH POT "PA" | 18 9 \$ 10 AND THE PERSONAL AUTHOR IN 11 THRU 30; | TO PRECENT A COCRESTIC AUTHOR SENROH PUT "CA" | 10 G & 10 AND THE COLORSHIE AUTHOR IN 11 THRU 80; | OFFICE SCHILLS WORDS & SCHILL PUT "CN" | MARRIN 11 THRU 30; | PERFORM A SERIES NUMBER SEMPCH PUT "SR" | IN 9\$10 AND THE SECONS NUMBER IN 11 THRU 40. |
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SPECIAL LISTING PROSCAMS TO LIST TITLE, DATE, & FORESTIONS NUMBER BY CHAIN LINE NOW BY A THRU 9 · TO LIST TITLE, DATE, THE SELVIN NOWBER BY
PURSANAL AUTHOR - PUT "SPTIGNOL" IN CALD COLUMNS I THRU 9 · TO LIST TITLE, DATE, & ACCESSION NUMBER BY X THIS OWN IS USAN SILE THE "FORACE" AND "ACCLIST" CYTICAL

C-8

SPECIAL LISTINGS OPTION CARD

THE APPRICAPINTE OPTION CHICO MUST AN USED WITH SOLLY FORACC ; "ACCLIST" +

TO LIGHT TITLE, DATE, & ACCESSION NUMBER BY
1ST & 2ND CREEDENTE AUTHOR-PUT "SPINONOH" IN CARD POLUMNS LTHRU 9

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APPENDIX D
RECORD FORMATS

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APPENDIX D

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AMC "ORE . 1601.8

APPENDIX D

DATA PROCESSING STORAGE FORMAT

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APPENDIX D TEMPERATY ABSTRACT FILE ABSTRACT HILE: AESIGAT POSES CONTRACTOR DATA 3417 C. DATA F ELD TYP. DATA DATA D-8

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APPENDIX D DATA PROCESSING STORAGE FORMAT REPORT TITLE REPORT 11740 (1501) FILE NAME: BOL-OTHERIN THIS RECORD LENGTH: 247 CHANNOTEIS BLOCKING FACTOR: 2:1 HEDA: DISK PACK ASCERT. DATA 5,00 D-10 4. O EATA DATA

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APPENDIX E
PRINTED OUTPUT FORMATS

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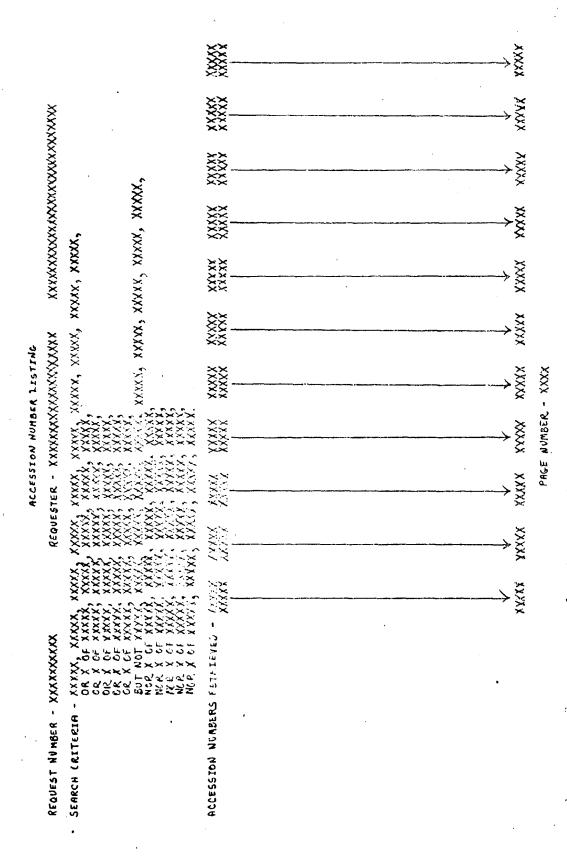
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APPENDIX H
OPERATING INSTRUCTIONS

| MAX.TIME 10  | SEQUENCE NO.                     |     |
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| RUN ID TOO!  | RUN NAME FARER TAPE READ PROGRAM |     |
| REQUESTER  | ATTEND AUTH.                     |     |
| COST CENTER  | WORK CODE STEP                   |     |
| FORE/BACK_   | MEOS/OTHER_                      |     |
| JUMP SWITCH: 1.  | ,2,3,4,5                         |     |
| MAG.TAPE: IN: UNIT LUN   | LABEL RUNG DISPOCITION           |     |
| our:   | TRE-IN 1 2N -015 100 -007000     | . , |
| PAPER TAPE: IN: LABEL  OUT: LABEL  SPECIAL INSTRUCTION  ON PARENTAL CON  O | DISPOSITION  FORM NO             |     |

| NO.                | CAUSE/CORRECTIVE ACTION |             |  |  |  |
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| REQUESTER                |             |                 |          | ATTEND        | AUTH                                    |
| COST CENTER              |             | WORK C          | ODE      | STE           | )                                       |
| FORE/PACK                |             | MEOF/OTH        | ER       |               |   |
| JUM> SWITCH: 1.          |             |                 |          |               |   |
| MAG.TAPE:                |             |                 |          |               | TAL OF THE ALL                          |
| 1 1                      | l           | LABEL           |          | RING          | DISPOCITION                             |
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| OUT:                     |             |                 |          |               |   |
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| PRINTER:                 |             |                 |          |               |   |
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| PAPER TAPE:<br>IN: LAREL |             | DISPOS          | ITICN    |               |   |
| OUT: LABEL_              |             | DISP <b>O</b> S |          |               |   |
| SPECIAL INSTRU           | CTIONS:     |                 |          |               |   |
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| REQUES  | TSR     |                |  |                    | ATTL:   | AUPH.             |  |
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| OUT: L<br>DISK:<br>PACK N<br>PRINTE<br>LABEL<br>PAPER | ABEL CO | 7/1            | DISTORED DIS | S FILE             |         | ion, in on        | 10. 10. 12. 12. 13. 13. 13. 13. 13. 13. 13. 13. 13. 13 |
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| REQUESTER   |                        | ATTEND_      | AUTH.                                  | ······································ |
| COST CENTER   |                        |              |  |  |
| FURE/BACK   | MSOF/OTHER             |              |  |  |
| JUMP SWITCH: 1. ,2.   | ٠,٥٠ و                 | ,5           | •                                      | n = 4 4 p m 2 g m 4                    |
| MAG.TAPE:<br>IN: UNIT LUN L   | ABEL RYEL              | RING         | DISPO                                  | CITION                                 |
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| DISK:<br>PACK NO. THE CALLES,   |                        |              | ************************************** |  |
| PRINTER: LABEL FORM   |                        |              |  |  |
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| OUT: LABEL  | DISPOSITION            |              |  |  |
| SPECIAL INSTRUCTIONS:  SPECIAL INSTRUCTIONS: | ARDS IST<br>IPUT IN AN | y one<br>one | ATE CARI<br>IMURL NU<br>RUN.           | D, 85<br>МВел <del>г</del><br>ТНЕ      |

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| REQUESTER                  |             |         | ATTENU  | AUTH.   |
| COST CENTER                | WORK CO     | ))E     | STR     | (t)   |
| FORE/BACK                  | MEOF/OTHI   | IR      |         |   |
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| OT:                        | THESPORUS   | 1_      | OUT     | SAUF  |
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| OUT: LABEL                 | DISPOSI     | rion    |         |   |
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| OUT: LABEL                 | DISPOSI     | rion    |         |   |
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| REQUES             |          |               |                 |                    |            |             | AUTH.                | _     |
| COST C             | enter_   |               | VORK            | COI                | )E         | ST          | ED.                  |       |
| fore/b             | ACK      |               | MS:0F/0         | TH_A               | }          |             | *************        |       |
| JUM> S             | WITCH:   | 1.            | ,2              | ,3                 | , 4        | •,5         | *                    | · ••• |
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| "Restore"          |          | 02            | SERREH          |                    | 1          | OUT         | SAUE                 |       |
| OUT:<br>FUC        |          | 01            | DICTION MAY     | <del> </del>       | 1          | IN          | SAVE                 | -     |
| "SAVE"             |          | 02            | SEMILLH<br>FILE |                    | Ī          | IN          | SAUE                 | -     |
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| DISK:<br>PACK N    | Dic'     | tildar<br>Tie | Y SEA           | rei<br>The         | H<br>- ,   |             | •                    |       |
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| MAX.TIME                       | 10                               |                      | SEQUENCE NO.       |                        |  |     |  |
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| RUN ID 1                       | R07                              | RUN NAME             | HEBEE<br>DISCI     | VINTED CH<br>PTOP REST | PATICAL FILE & SA                            | UE  |  |
| REQUESTER                      |                                  |                      | 1-1-6-7            | 6 77 70 1 4            | AUTH.  |     |  |
| COST CENT                      | er                               | WORK CO              | )E                 | STEP                   |  |     |  |
| FORE/BACK                      |                                  | MSOS/OTHER           | 3                  | <del></del>            |  |     |  |
| JUMP SWIT                      | CH: 1.                           | ,2,,3,_              | ,4                 | ,5                     |  |     |  |
| MAG.TAPE:                      | IT LUN                           | 1 3                  | REEL               | RING                   | DISPOCITION                                  |     |  |
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SMUFD FORM 2006 (Test) (Aug 68)

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